**TABLE 3.2**
*American Wire Gage (AWG) sizes.*

| | AWG # | Area (CM) | Ω/1000 ft at 20°C | Maximum Allowable Current for RHW Insulation (A)* |
|---|---|---|---|---|
| (4/0) | 0000 | 211,600 | 0.0490 | 230 |
| (3/0) | 000 | 167,810 | 0.0618 | 200 |
| (2/0) | 00 | 133,080 | 0.0780 | 175 |
| (1/0) | 0 | 105,530 | 0.0983 | 150 |
| | 1 | 83,694 | 0.1240 | 130 |
| | 2 | 66,373 | 0.1563 | 115 |
| | 3 | 52,634 | 0.1970 | 100 |
| | 4 | 41,742 | 0.2485 | 85 |
| | 5 | 33,102 | 0.3133 | — |
| | 6 | 26,250 | 0.3951 | 65 |
| | 7 | 20,816 | 0.4982 | — |
| | 8 | 16,509 | 0.6282 | 50 |
| | 9 | 13,094 | 0.7921 | — |
| | 10 | 10,381 | 0.9989 | 30 |
| | 11 | 8,234.0 | 1.260 | — |
| | 12 | 6,529.9 | 1.588 | 20 |
| | 13 | 5,178.4 | 2.003 | — |
| | 14 | 4,106.8 | 2.525 | 15 |
| | 15 | 3,256.7 | 3.184 | |
| | 16 | 2,582.9 | 4.016 | |
| | 17 | 2,048.2 | 5.064 | |
| | 18 | 1,624.3 | 6.385 | |
| | 19 | 1,288.1 | 8.051 | |
| | 20 | 1,021.5 | 10.15 | |
| | 21 | 810.10 | 12.80 | |
| | 22 | 642.40 | 16.14 | |
| | 23 | 509.45 | 20.36 | |
| | 24 | 404.01 | 25.67 | |
| | 25 | 320.40 | 32.37 | |
| | 26 | 254.10 | 40.81 | |
| | 27 | 201.50 | 51.47 | |
| | 28 | 159.79 | 64.90 | |
| | 29 | 126.72 | 81.83 | |
| | 30 | 100.50 | 103.2 | |
| | 31 | 79.70 | 130.1 | |
| | 32 | 63.21 | 164.1 | |
| | 33 | 50.13 | 206.9 | |
| | 34 | 39.75 | 260.9 | |
| | 35 | 31.52 | 329.0 | |
| | 36 | 25.00 | 414.8 | |
| | 37 | 19.83 | 523.1 | |
| | 38 | 15.72 | 659.6 | |
| | 39 | 12.47 | 831.8 | |
| | 40 | 9.89 | 1049.0 | |

**TABLE 3.1**
*Resistivity (ρ) of various materials.*

| Material | ρ @ 20°C |
|---|---|
| Silver | 9.9 |
| Copper | **10.37** |
| Gold | 14.7 |
| Aluminum | 17.0 |
| Tungsten | 33.0 |
| Nickel | 47.0 |
| Iron | 74.0 |
| Constantan | 295.0 |
| Nichrome | 600.0 |
| Calorite | 720.0 |
| Carbon | 21,000.0 |

(in CM-Ω/ft)

$$R = \frac{\rho l}{A_{cm}}$$

$$1\,CM = \frac{\pi}{4}\ \text{sq. mils.}$$

$$Q = It$$

$$W = QV$$